

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

In the Matter of )  
 )  
Section 68.4(a) of the Commission's Rules, ) RM-8658  
Hearing Aid-Compatible Telephones )

**REPLY OF DANA MULVANY TO COMMENTS RE: WAC'S PETITION**

I, Dana Mulvany, submit my comments as a hard of hearing individual with hearing loss in both ears. I have used a telecoil-equipped hearing aid in my right ear for approximately 20 years and have found the telecoil invaluable in using telephones with the unfortunate exception of most digital wireless telephones.

In this document, I shall be responding to the comments of CTIA and Verizon. I happen to have been at the 2001 Consumer Electronics Show in Las Vegas from January 6<sup>th</sup> through this date and was able to communicate with representatives of several major PCS manufacturers regarding electromagnetic compatibility of PCS phones with hearing aids.

In their comments, both CTIA and Verizon indicate that providing effective electromagnetic coupling in PCS phones with all hearing aids is not technologically feasible. (CTIA asserts "it is virtually impossible to create a "one size fits all" solution for every phone and every hearing aid" (pg 6); Verizon states: "technology has not yet advanced to the point where wireless handsets, and, in particular, digital wireless handsets, can be made hearing aid-compatible.") I take issue with these assertions on several different points:

- A. According to Dr. Muzibul Khan of Samsung, Samsung deliberately developed three successive phones to be accessible to people with disabilities (the SCH-2000, 3500 and 8500 PCS phones), which appear to cause no interference for any known hearing-aid wearer. Dr. Khan and Peter A. Skarzynski, also of Samsung, both stated to me on 1/7/2001 that they have not received reports of interference with these phones. Although it is possible that these Samsung phones could cause interference for some hearing aid users who have not reported this, it still appears that it is technologically feasible to make considerable strides in reducing interference for most and possibly all hearing aid users. (I did hear several PCS manufacturers state it was not possible to reduce interference for all hearing aids; they appeared genuinely unaware of progress made by other companies.)

PCS phones with a similar design from other manufacturers (clamshell in

appearance with the earpiece physically separate from the antenna) also tend to have less interference. Two PCS manufacturers said that distancing the earpiece from the transmitter is also necessary for reducing interference; this is also achieved by a clamshell design but could potentially be achieved other ways.

- B. From anecdotal reports from other hard of hearing people, I have heard that interference appears to be eliminated even in a PCS phone if it is in analog mode. It would thus be helpful to hard of hearing people if PCS phones which cause interference in the digital mode could be switched to analog. Many PCS phones already offer the capability to switch to analog when there is no digital network but they often do not give the user the choice of manually switching to analog.
- C. Wild NRG (<http://www.wildnrg.com>), a company in California which has developed specialized material to shield PCS phone users from radio frequency emissions, believes it would be possible to shield PCS phones internally but still permit inductive coupling. Another hearing aid user and I experienced that our hearing aids were able to couple inductively with several PCS phones without interference, using Wild NRG's proprietary material. This possibility needs much more exploration and testing with multiple hearing aid users, but if successful, it would appear quite feasible with all PCS phones, including those using GSM and TDMA, as well as the less problematic CDMA protocol.
- D. Little is known of actual efforts by PCS manufacturers to research how to make PCS phones more electromagnetically compatible for hearing aids (although some companies appear to have figured out how to do this for some phones). Through my interactions with some PCS companies, it appears doubtful that some are making any effort at all to research how to make their phones free from interference. Too many manufacturers seem to think compatibility with external accessories is entirely sufficient (when asked if their phones are HAC, representatives smile and say that their phones are compatible with accessories). Industry representatives who say that reducing interference is not technologically feasible should be asked to show evidence of extensive and recent efforts to find technological solutions.

Both CTIA and Verizon emphasize the need for hearing aids to be immunized, as if the problem of interference is entirely within hearing aids. Consider, however, that my own hearing aid experiences significant interference with some PCS phones but not with others; the difference clearly is not due to the hearing aid but to the design of the phone. This variation in experiencing interference not uncommon for people with hearing aids. Clearly PCS phones *can* be designed in a way that is accessible to hearing aid wearers.

Additionally, all PCS phones still need to be HAC regardless of interference for older hearing aids that are not immunized. Immunized hearing aids would still be unable to couple inductively with phones if the phones are not HAC.

Verizon states: "EXTERNAL DEVICES ARE READILY AVAILABLE THAT MAKE OTHERWISE NON-COMPATIBLE WIRELESS DEVICES COMPATIBLE WITH HEARING AIDS." (pg. 6)

Such accessories are expensive, inconvenient, cumbersome, fragile, and usually dependent on separate batteries. These would not provide functionally equal access to the wireless telephone even if they were provided gratis. Service providers and other suppliers sell them at high prices that can rival or surpass the cost of the PCS phone. The accessories certainly do not provide the easy, always available access which normally hearing people take for granted with their phones.

Suppose, for example, that you are a hard of hearing person playing volleyball and your phone rings loudly. Imagine dashing to the phone, hurriedly finding, extracting and attaching the accessory to your person, finding and turning on the accessory's power switch, turning on the hearing aid's telecoil, and answering the call before the caller has hung up. (People with slow manual dexterity, vision impairment, or slower cognitive processing are even more unlikely to manage answering a phone with an accessory quickly.) Such an experience of merely attempting to answer a ringing phone is much more stressful, problematic and likely to fail when an accessory is required than when it is not. Hard of hearing people need the same ease of use in answering a call quickly which hearing people take for granted.

Verizon mentions that one of the "hearing-aid compatible" accessories available for PCS phones is "a headset manufactured by Plantronics. The Plantronics headset has a microphone and earpiece just like any other headset, but also has a T-coil that makes it hearing aid-compatible. The Plantronics headset is available today and is part of Verizon Wireless' product line."

I tested this headset on 1/7/01 and found it was not designed for use with behind-the-ear (BTE) hearing aids. When the earpiece is placed over an ear wearing a BTE hearing aid, the electromagnetic field responsible for conveying the audio does not reach adequately to the hearing aid. If the earpiece is placed over the hearing aid directly to improve the electromagnetic connection, the microphone juts too far away from the mouth. In contrast, a HAC phone generally allows a hearing-aid user (using either an in-the-ear hearing aid or BTE hearing aid) to use both the earpiece and the microphone as normally hearing people do. Accessories that are capable of generating an electromagnetic field compatible with hearing aids are unfortunately not necessarily able to be worn with them (such as earbuds that may generate a strong field but which cannot be worn by an ear already wearing a hearing aid).

Verizon's mention of this headset and the HATIS, another expensive accessory costing \$175 or more, indicates an attitude that if there are external accessories available that appear to provide hearing-aid compatibility to hearing-aid users (no matter how expensive), there is no need to reduce interference in PCS phones. These accessories impose *additional* burdens on hearing-aid users, however, and cannot be said to provide the same expedient access to the phone experienced by normally hearing people.

Verizon states: "However, given most customers' desire to own and use small portable wireless devices that couple the transmitter and earpiece in one small unit, the public interest would not be served by requiring manufacturers to separate the earpiece and the transmitter in all units in the name of hearing aid compatibility." (pg. 8)

With the rapidly increasing availability of wireless web browsing and two-way email paging, many customers are actually preferring larger multi-function wireless phones with an adequately large screen to display these features. In such phones and in others of a minimum size, it appears quite possible to place the transmitter as far away as possible from the earpiece for effective reduction of interference.

Nothing in CTIA's or Verizon's recent comments appears to argue against making all PCS phones hearing-aid compatible, i.e., capable of coupling electromagnetically with a hearing aid's telecoil. Hearing-aid compatibility is fairly simple, technologically. Rather, their arguments appear to focus on the problem of interference, which is an accessibility issue addressed in Section 255 of the Telecommunications Act. At a minimum, the FCC could require that all new PCS phones be capable of inductive coupling with hearing aids and apply Section 255 standards to how interference is managed in each phone.

I would remain concerned, however, that the wireless industry as a whole might continue to do little research in resolving the interference problems even with this change. The industry's funded research arm took five years to develop standards of interference and immunity rather than developing positive solutions for reducing interference; hard of hearing people cannot afford to wait more years at this snail's pace as they are left further and further outside of society.

Perhaps thinking outside of the box is needed in order to expand options in PCS phones for hearing-aid users. Perhaps the FCC could somehow encourage the industry to pool resources in researching and sharing methods for reducing interference. Perhaps all service providers could be required to provide at least one accessible PCS phone at no additional cost to the hearing-aid user above what other customers pay (putting more pressure on manufacturers to develop accessible phones). The chances for success would be even greater if the industry would work directly with knowledgeable users of hearing aids in searching for and trying solutions.

Thank you for your attention to this troubling problem.

Sincerely,

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